CONTENTS VOLUME 31

Number 1, January 1989

CHARLES GEORGES THIBAULT, RECIPIENT OF THE 1989 EMBRYO TRANSFER PIONEER AWARD.....1

ANALYSIS OF APPLICATIONS OF EMBRYO TRANSFER IN DEVELOPING COUNTRIES
G.E. Seidel, Jr. and S.M. Seidel.....3

THE GENETIC IMPROVEMENT OF CATTLE IN DEVELOPING COUNTRIES
E.P. Cunningham.....17

THE RELEVANCE OF MOET PROGRAMMES TO DEVELOPING COUNTRIES
B. McGuirk.....29

EMBRYO TRANSFER IN DEVELOPING COUNTRIES-SAUDI ARABIA
M.P. Boland and I. Gordon.....41

ESTABLISHMENT OF A PERMANENT EMBRYO TRANSFER AND SEMEN PRODUCTION ENTERPRISE AND FACILITY IN LATIN AMERICA
J.G. Peeples and A.J. Oden.....45

MEXICAN GOVERNMENT USES EMBRYO TRANSFER TO INCREASE PRODUCTION OF NATIONAL DAIRY HERD
R.P. Elsden.....47

TREATMENT OF SPERM TO PREDETERMINE SEX
R.P. Amann.....49

IN VITRO MATURATION AND FERTILIZATION OF BOVINE OOCYTES
M.L. Leibfried-Rutledge, E.S. Critser, J.J. Parrish and N.L. First.....61

PROSPECTS FOR THE COMMERCIAL CLONING OF ANIMALS BY NUCLEAR TRANSPLANTATION
J.M. Robl and S.L. Stice.....75

EQUILIBRIUM AND NONEQUILIBRIUM CRYOPRESERVATION OF MAMMALIAN EMBRYOS
S.P. Leibo.....85

THE USE OF MALE-SPECIFIC CHROMOSOMAL DNA FRAGMENTS TO DETERMINE THE SEX OF BOVINE PREIMPLANTATION EMBRYOS
K.R. Bondioli, S.B. Ellis, J.H. Prior, M.W. Williams and M.M. Harpold.....95

CONTENTS VOLUME 31

Number 1, January 1989

CHARLES GEORGES THIBAULT, RECIPIENT OF THE 1989 EMBRYO TRANSFER PIONEER AWARD.....1

ANALYSIS OF APPLICATIONS OF EMBRYO TRANSFER IN DEVELOPING COUNTRIES
G.E. Seidel, Jr. and S.M. Seidel.....3

THE GENETIC IMPROVEMENT OF CATTLE IN DEVELOPING COUNTRIES
E.P. Cunningham.....17

THE RELEVANCE OF MOET PROGRAMMES TO DEVELOPING COUNTRIES
B. McGuirk.....29

EMBRYO TRANSFER IN DEVELOPING COUNTRIES-SAUDI ARABIA
M.P. Boland and I. Gordon.....41

ESTABLISHMENT OF A PERMANENT EMBRYO TRANSFER AND SEMEN PRODUCTION ENTERPRISE AND FACILITY IN LATIN AMERICA
J.G. Peeples and A.J. Oden.....45

MEXICAN GOVERNMENT USES EMBRYO TRANSFER TO INCREASE PRODUCTION OF NATIONAL DAIRY HERD
R.P. Elsden.....47

TREATMENT OF SPERM TO PREDETERMINE SEX
R.P. Amann.....49

IN VITRO MATURATION AND FERTILIZATION OF BOVINE OOCYTES
M.L. Leibfried-Rutledge, E.S. Critser, J.J. Parrish and N.L. First.....61

PROSPECTS FOR THE COMMERCIAL CLONING OF ANIMALS BY NUCLEAR TRANSPLANTATION
J.M. Robl and S.L. Stice.....75

EQUILIBRIUM AND NONEQUILIBRIUM CRYOPRESERVATION OF MAMMALIAN EMBRYOS
S.P. Leibo.....85

THE USE OF MALE-SPECIFIC CHROMOSOMAL DNA FRAGMENTS TO DETERMINE THE SEX OF BOVINE PREIMPLANTATION EMBRYOS
K.R. Bondioli, S.B. Ellis, J.H. Prior, M.W. Williams and M.M. Harpold.....95

CO-CULTURE OF DOMESTIC ANIMAL EMBRYOS
C.E. Rexroad, Jr.....105

ASSESSING THE VIABILITY OF PREIMPLANTATION EMBRYOS IN VITRO
J.E. Butler and J.D. Biggers.....115

ESTROGEN CONJUGATE MEASUREMENTS TO MONITOR OVARIAN ACTIVITY
B.L. Lasley, M. Troedsson, W. Bravo and M.A. Haggerty.....127

EMBRYO COLLECTION AND TRANSFER IN SMALL RUMINANTS
D.C. Kraemer.....141

CONCEPTS FOR REGULATION OF CORPUS LUTEUM FUNCTION BY THE CONCEPTUS AND OVARIAN FOLLICLES TO IMPROVE FERTILITY
W.W. Thatcher, K.L. Macmillan, P.J. Hansen and M. Drost.....149

EFFECT OF TIME OF ADMINISTRATION OF MONOCLONAL ANTI-PMSG ON SUPEROVULATORY RESPONSE AND EMBRYO QUALITY IN CATTLE
M.M. Alfuraiji, P.J. Broadbent, J.S.M. Hutchinson, D.F. Dolman and T. Atkinson.....165

NONSURGICAL EMBRYO TRANSFER IN CATTLE: THE EFFECT OF CLENBUTEROL ON PREGNANCY RATES
A.P. Almeida.....166

GENE TRANSFER IN FISH EMBRYOS FOR INCREASED PRODUCTIVITY
D. Alok and J.S. Khillan.....167

EFFECTS OF CULTURE SYSTEM ON DEVELOPMENT OF IN VITRO FERTILIZED BOVINE OVA INTO BLASTOCYSTS
Y. Aoyagi, Y. Fukui, Y. Iwazumi, M. Urakawa, Y. Minegishi and H. Ono.....168

EFFECT OF SUPEROVULATION ON REPRODUCTION
A. Bak, T. Greve and M. Schmidt.....169

EFFECT OF SUPEROVULATION ON MILK PRODUCTION
A. Bak, T. Greve, M. Schmidt and T. Liboriussen.....170

VIABILITY OF INNER CELL MASS VERSUS TROPHECTODERMAL CELLS OF FROZEN-THAWED HORSE EMBRYOS
B.E. Barry, D.L. Thompson, Jr., K.L. White T.C. Wood, M.H. Rabb and D.R. Colborn.....171

LOW DOSES OF FSH STIMULATE FOLLICULAR GROWTH AND MATURATION IN ANESTROUS HEIFERS
J.F. Beckers, P. Ballman-Wouters, I. Viviers-Donnay, K. Touati, G. Doem, B. Lhoest, E. Lambert, Y. Laurent, F.J. Ectors and F. Ectors.....172

RATES OF DEVELOPMENT OF MURINE EMBRYOS IN MEDIUM WITH GROWTH FACTORS
A. Bielanski and W.C.D. Hare.....173

EFFECT OF A SERUM SUBSTITUTE, CYCLIC CMP OR CYCLIC AMP ON DEVELOPMENT RATES OF BOVINE EMBRYOS
A. Bielanski, W.C.D. Hare and B.R. Yadav.....174

CULTURING TWO- TO EIGHT-CELL CAPRINE EMBRYOS USING DOMESTIC CHICKEN EGGS
E.G. Blakewood, S.H. Pool, J.F. Pritchard and R.A. Godke.....175

CULTURING EARLY-STAGE BOVINE MORULAE USING DOMESTIC CHICKEN EGGS
E.G. Blakewood, S.H. Pool, K.E. Wiemer and R.A. Godke.....176

POST-THAW VIABILITY OF BOVINE EMBRYOS CULTURED IN DOMESTIC CHICKEN EGGS OR ON EPITHELIAL MONOLAYERS PRIOR TO FREEZING IN LIQUID NITROGEN (LN2)
E. G. Blakewood, K.E. Wiemer and R.A Godke.....177

RESULTS OF A COMMERCIAL SHEEP EMBRYO TRANSFER PROGRAM
B.C. Buckrell, C.J. Gartley and W.H. Johnson.....178

USE OF PMSG ANTISERA IN SUPEROVULATED DAIRY HEIFERS
H. Callesen, A. Bak, T. Greve, B. Avery, P. Gotfredsen, P. Holm, P. Hyttel, J.O. Pedersen, M. Schmidt, S. Smith and N. Svanborg.....179

HORMONAL PARAMETERS FOR EVALUATION OF SUPEROVULATED HEIFERS
H. Callesen, A. Bak, T. Greve, B. Avery, P. Gotfredsen, P. Holm, P. Hyttel, J.O. Pedersen, M. Schmidt, S. Smith and N. Svanborg.....180

EVALUATING BOVINE EMBRYO QUALITY BY COMPUTERIZED IMAGE ANALYSIS
P.L. Casey, C.R. Looney, D.C. Casey, C.R. Youngs and R.A. Godke.....181

TRANSFER OF IMPORTED EMBRYOS TO ZEBU RECIPIENTS IN TROPICAL VENEZUELA
M.D. Darrow.....182

PORCINE, EQUINE AND OVINE FSH IN THE SUPEROVULATION OF CATTLE
L.E. Donaldson.....183

EMBRYO RECOVERY FROM EARLY POSTPARTUM BEEF COWS
C.G. Dorm, J.F. Baker, R. Knutson and D.C. Kraemer.....184

FOLLICULAR DETECTION IN GOATS BY ULTRASONOGRAPHY
C.G. Dorn, B.A. Wolfe, E. Bessoudo and D.C. Kraemer.....185

SUCCESSFUL ASYNCHRONOUS EMBRYO TRANSFER IN CATTLE
M. Drost, H.S. Tan, K.L. Macmillan and W.W. Thatcher.....186

EFFECT OF TRYPSIN WASHING ON SURVIVABILITY OF BOVINE EMBRYOS
S.E. Echternkamp and S. Kappes.....187

IN VITRO MATURATION AND FERTILIZATION OF BOVINE OOCYTES
F.J. Ectors, P. Van Der Zwalmen, K. Touati, J.F. Beckers and F. Ectors.....188

COMPARISON OF MEDIA IN AN EARLY BOVINE EMBRYO AND OVIDUCT EPITHELIAL CELL CO-CULTURE SYSTEM
J.E. Ellington, E.W. Carney, M.E. Simkin and R.H. Foote.....189

THE EFFECT OF EXOGENOUS ESTRADIOL ON BOVINE EMBRYO QUALITY
J.E. Ellington, W. Vredenburgh and R.H. Foote.....190

VARIATION IN BOVINE EMBRYO DEVELOPMENT IN VITRO DUE TO BULLS
W.H. Eyestone and N.L. First.....191

MULTIPLE EMBRYO PRODUCTION IN THE COW AFTER LAPAROSCOPIC OOCYTE COLLECTION AND TRANSFER
R.A. Fayrer-Hosken and B. Stroud.....192

POST-THAW MOTILITY PARAMETERS OF FROZEN SEMEN FROM SCIMITAR-HORNED ORYX (Oryx dammah): EFFECTS OF FREEZING METHOD, EXTENDER AND RATE OF THAWING
W.B. Foxworth, B.A. Wolfe, N.M. Loskutoff, L.A. Nemec, S.L. Huntress, B.L. Raphael, J.M. Jensen, B.W. Williams, J.G. Howard and D.C. Kraemer.....193

CULTURE OF EQUINE EMBRYOS IN COMPLETE MEDIA WITH OVIDUCTAL TISSUE
D.A. Freeman, J.E. Butler, J.A. Weber, R.T. Geary and G.L. Woods.....194

INDUCTION OF PARTURITION IN THE COW: THE EFFECT OF PROSTAGLANDIN TREATMENT ON THE INCIDENCE OF RETAINED PLACENTA
A. Garcia, A. Barth and R.J. Mapletoft.....195

EMBRYO COLLECTION, SPLITTING AND TRANSFER IN THE COMMON ELAND (Tragelaphus oryx)
E.J. Gelwicks, C.E. Pope, D.G. Gillespie, M.S. Burton and B.L. Dresser.....196

THE EFFECT OF RHESUS UTERINE EPITHELIAL CELL MONOLAYERS ON IN VITRO GROWTH OF RHESUS EMBRYOS
L.L. Goodeaux, S.A. Voelkel, C.A. Anzalone, Y. Menezo and K.H. Graves.....197

PREGNANCY AFTER TRANSFER OF BISECTED BOVINE EMBRYOS OBTAINED FROM IN VITRO FERTILIZATION
K. Goto, Y. Kajihara, M. Koba, Y. Nakanishi and K. Ogawa.....198

THE INFLUENCE OF THE PRESENCE OF A DOMINANT FOLLICLE AT THE TIME OF INITIATION OF A SUPEROVULATORY TREATMENT ON SUPEROVULATORY RESPONSES IN CATTLE
F. Grasso, L.A. Guilbault, G.L. Roy, P. Matton and J.G. Lussier.....199

CONCENTRATIONS OF PROGESTERONE AND FSH IN SUPEROVULATED HEIFERS PRETREATED WITH FSH-P AT THE BEGINNING OF THE ESTROUS CYCLE
L.A. Guilbault, J.G. Lussier, F. Grasso and G.L. Roy.....200

EVALUATION OF RETURN TO ESTRUS IN SUPEROVULATED DAIRY HEIFERS FOLLOWING PROSTAGLANDIN TREATMENT
G.W. Halbert, K.E. Leslie, J.S. Walton and K.J. Betteridge.....201

FORMATION AND CHARACTERIZATION OF HORSE CONCEPTUS VESICLES IN VITRO
K.E. Hehnke, D.L. Thompson, Jr., K.L. White and T.C. Wood.....202

RAPID MILK PROGESTERONE ASSAY AS A TOOL FOR SCREENING POTENTIAL DONOR COWS PRIOR TO SUPEROVULATION
A. Herrler and H. Niemann.....203

EMBRYO TRANSFER IN MARES WITH GONADAL DYSGENESIS
K. Hinrichs, F.L. Riera and L.R. Klunder.....204

CORTICAL GRANULE DYNAMICS IN CATTLE OVA
P. Hyttel, T. Greve and H. Callesen.....205

THE PRODUCTION OF TWINS IN BEEF CATTLE UTILIZING EMBRYO TRANSFER TECHNOLNGY
W.H. Johnson, W.G. Etherington, E.P. de Rose, J.W. Wilton and N.C. Savage.....206

IN VITRO MATURATION AND FERTILIZATION OF DOMESTIC CAT FOLLICULAR OOCYTES
L.A. Johnston, S.J. O'Brien and D.E. Wildt.....207

ULTRASONIC OBSERVATIONS OF OVARIAN ACTIVITY UNDER INFLUENCE OF SYNCHRO-MATE-B IN THE COW
A.L. Jones, K. Moore and J.M. Wilson.....208

A RAPID NON-SUBJECTIVE ENZYME ASSAY TO MEASURE BOVINE EMBRYO VIABILITY
J.E. Jordan, S.K. Johnson and R.D. Page.....209

IN VITRO MATURATION, FERTILIZATION AND DEVELOPMENT OF BOVINE OOCYTES
C.I. Kim, J. Ellington and R.H. Foote.....210

CULTURING MURINE EMBRYOS ON BOVINE FETAL SPLEEN CELL FIBROBLAST AND CHICK EMBRYO FIBROBLAST MONOLAYERS
H.N. Kim, Y.X. Hu, J.D. Rousse and R.A. Godke.....211

MONOLAYERS OF BOVINE FETAL SPLEEN CELLS AND CHICK EMBRYO FIBROBLASTS FOR CO-CULTURE OF BOVINE EMBRYOS
H.N. Kim, J.D. Roussel, G.F. Amborski, Y.X. Hu and R.A. Godke.....212

CHROMOSOME PREPARATION FROM BOVINE SPERMATOZOA
A. Kovacs and R.H. Foote.....213

ROLE OF PLATELET ACTIVATING FACTOR (PAF) IN MOUSE IN VIRTO FERTILIZATION
F.B. Kuzan, F.T. Geissler and W.R. Henderson, Jr.....214

MATERNAL INFLUENCE ON GESTATION LENGTH AND CHARACTERISTICS AT BIRTH OF EMBRYO TRANSFER HOLSTEIN CALVES
S. Lapierre, L.A. Guilbault, G.L. Roy and D.P. Menard.....215

EMBRYO TRANSFER IN MULTIPAROUS SOWS IN KOREA
K.W. Lee, D.S. Son, C.S. Park and S.H. Chee.....216

PURIFICATION OF FOLLICLE STIMULATING HORMONE FROM BOVINE PITUITARY EXTRACTS BY MONOCLONAL ANTIBODY AFFINITY CHROMATOGRAPHY
C.E. Lindsell, J.G. Lussier and B.D. Murphy.....217

EFFECT OF COOLING TEMPERATURES ON PRE-COMPACTED BOVINE EMBRYOS
C.R. Looney, M.E. Westhusin and K.R. Bondioli.....218

IN VITRO SURVIVAL OF MOUSE EMBRYOS FROZEN BY DIRECT PLUNGING INTO LIQUID NITROGEN AND VITRIFICATION
R.F.F. Lopes, J.L. Rodrigues and L. Christmann.....219

EFFECTS OF DIFFERENT EXTENDERS AND HOLDING TEMPERATURES ON VIABILITY OF SPERMATOZOA FROM THE SCIMITAR-HORNED ORYX
N.M. Loskutoff, L.A. Nemec, W.B. Foxworth, B.A. Wolfe, B.L. Raphael, S.L. Huntress, J.M. Jensen, B.W. Williams, J.G. Howard and D.C. Kraemer.....220

A PRELIMINARY REPORT ON THE EFFICACY OF PERGONAL FOR IN VITRO FERTILIZATION (IVF) AND GAMETE INTRAFALLOPIAN TRANSFER (GIFT) IN THE WESTERN LOWLAND GORILLA (Gorilla gorilla gorilla)
N.M. Loskutoff, B. Yee, R.C. Cambre, P.P. Calle, S.L. Huntress, T.R. Bowsher, R.R. Chacon, B.L. Raphael, J.M. Putman and D.C. Kraemer.....221

BIRTH OF CALVES AFTER IN VITRO MATURATION AND FERTILIZATION OF FOLLICULAR OOCYTES
K.H. Lu, H.F. MacDonnell and I. Gordon.....222

EFFECT OF THAWING TEMPERATURE AND TIME TO SUCROSE DILUTION ON SURVIVAL OF MOUSE EMBRYOS IN CULTURE
R.J. Mapletoft, J. Moker and A. Palasz.....223

THE EFFECT OF TIME FOR ICE CRYSTAL FORMATION ON SURVIVAL OF FROZEN/THAWED MOUSE EMBRYOS IN CULTURE
R.J. Mapletoft, J. Moker and A. Palasz.....224

THE EFFECT OF SUCROSE CONCENTRATION, TEMPERATURE AND TIME ON SURVIVAL OF FRESH MOUSE EMBRYOS IN CULTURE
R.J. Mapletoft, J. Moker and A. Palasz.....225

THE USE OF ETHYLENE GLYCOL FOR CRYOPRESERVATION OF SHEEP EMBRYOS
L.K. McGinnis, S.C. Duplantis, Jr., S.L. Waller and C.R. Young.....226

CULTURE AND MANIPULATION OF EARLY GOAT EMBRYOS
K.J. McLaughlin, S.K. Walker, L. Davies, B. Mawson and R.F. Seamark.....227

OOCYTE RECOVERY, MATURATION AND FERTILIZATION IN VITRO IN THE PUMA (Felis concolor)
A.M. Miller, M.E. Roelke, K.L. Goodrowe, J.G. Howard and D.E. Wildt.....228

A LIMITED EXPOSURE OF MURINE OOCYTES AND ZYGOTES TO PHOSPHATE BUFFERED SALINE RETARDS DEVELOPMENT IN VITRO
B.S. Minhas, G.W. Randall, M.G. Dodson and J.L. Robertson.....229

THE RESULTS OF THE FIRST FROZEN BOVINE EMBRYOS EXPORTED FROM THE USA TO ARGENTINA
C.J. Munar and J.F. Hasler.....230

ESTIMATING PREGNANCY RATES FROM THE NUMBER OF EMBRYOS COLLECTED AND THOSE OF TRANSFERABLE QUALITY FOR HOLSTEIN DONOR FEMALES FROM A SINGLE HERD UNIT
R.L. Munyakazi, R.S. Denniston, K.E. Wiemer, R.H. Price, P.E. Humes and R.A. Godke.....231

LOW TEMPERATURE SENSITIVITY OF BLASTOCYSTS AND BLASTOCYST-DERIVED CELLS IN PIGS
H. Nagashima, Y. Kato, H. Yamakawa and S. Ogwawa.....232

INTRODUCTION OF DNA INTO MURINE EMBRYOS BY ELECTROPORATION
L.A. Nemec, L.S. Skow, J.M. Goy and D.C. Kraemer.....233

PREGNANCY RATES AFTER CERVICAL TRANSFER OF BIOPSIED BOVINE EMBRYOS
M. Nibart, F. Mechekour, R. Procureur, B. Chesne, D. Chupin and M. Thibier.....234

CATHETER MODIFICATION FOR FLUSHING HEIFERS
D.D. Padgitt.....235

SUPEROVULATION OF HOLSTEIN HEIFERS UNDER HEAT STRESS WITH FSH-P OR FOLLTROPIN
R.D. Page, J.E. Jordan and S.K. Johnson.....236

LUTEINIZING HORMONE RELEASE IN THE COW: THE EFFECT OF DOSE OF TWO COMMERCIAL GnRH PREPARATIONS
A. Palasz, A. Garcia, A. Gonzales and R.J. Mapletoft.....237

FACTORS AFFECTING PREGNANCY RATE IN EMBRYO TRANSFER RECIPIENTS WITH REFERENCE TO PLASMA PROGESTERONE
A.J. Payas, P.J. Broadbent, D.F. Dolman and W.B. Christie.....238

INFLUENCE OF VARIOUS OVIDUCTAL EPITHELIAL CELL CULTURE SYSTEMS ON THE DEVELOPMENT OF EARLY CLEAVAGE STAGE BOVINE EMBRYOS IN VITRO
J.W. Pollard, K.P. Xu, R. Rorie, W.A. King and K.J. Betteridge.....239

EFFECT OF STEROIDS ON PROTEIN SYNTHESIS IN MATURE AND IMMATURE BOVINE OOCYTES
D. Pontbriand, A.K. Goff, K.P. Xu and W.A. King.....240

IN VITRO FERTILIZATION IN THE DOMESTIC CAT (*Felis catus*): A COMPARISON BETWEEN FRESHLY COLLECTED AND COOLED SEMEN
C.E. Pope, E.J. Gelwicks, K.B. Wachs, G.L. Keller and B.L. Dresser.....241

STRESS-RELATED LITTER DEFICITS IN THE GOLDEN HAMSTER
N.C. Pratt.....242

THE EFFECTS ON IN VITRO FERTILIZATION AND PREIMPLANTATION EMBRYONIC DEVELOPMENT OF AN ALTERNATIVE METHOD OF CUMULUS CELL REMOVAL
G.W. Randall, B.S. Minhas and M.G. Dodson.....243

EMBRYO TRANSFER AND ARTIFICIAL INSEMINATION IN SUNI (Neotragus moschatus zulyensis)
B.L. Raphael, N.M. Loskutoff, J.G. Howard, B.A. Wolfe, L.A. Nemec, M.C. Schiewe and D.C. Kraemer.....244

SURVIVAL OF BOVINE BLASTOCYSTS MICROINJECTED WITH LIPOSOME-ENCAPSULATED DNA
M.L. Reed, C.G. Dorn, J.M. Goy, L.C. Skow and D.C. Kraemer.....245

EFFECTS OF INCREASED EMBRYO/VOLUME RATIOS AND SOLCOSERYL PRODUCT ADDITION ON MURINE ZYGOTE DEVELOPMENT
M.L. Reed, A.R.L. Lalonde and K.C. Kraemer.....246

THE EFFECTS OF PLATELET ACTIVATING FACTOR ON THE MOTILITY OF HUMAN SPERMATOZOA
D.D. Ricker, B.S. Minhas, R. Kumar, G.W. Randall, M.G. Dodson, J.L. Harrill and J.L. Robertson.....247

SEROCONVERSION OF RECIPIENT EWES AFTER TRANSFER OF EMBRYOS EXPOSED TO Brucella ovis IN VITRO
M.G. Riddell, D.A. Stringfellow, D.F. Wolfe and P.K. Galik.....248

SIMULTANEOUS MEASUREMENT OF THE METABOLISM OF TWO ENERGY SUBSTRATES IN INDIVIDUAL HORSE AND COW EMBRYOS
D. Rieger, E. Palmer, D. Langeau and G. Tiffin.....249

ULTRARAPID FREEZING OF MOUSE EMBRYOS WITH DMSO AND TREHALOSE
J.L. Robertson, B.S. Minhas, G.W. Randall, M.G. Dodson, T.V. Palmer and D.D. Ricker.....250

SURVIVAL OF SHEEP X GOAT HYBRID INNER CELL MASSES AFTER INJECTION INTO OVINE EMBRYOS
T.L. Roth, G.B. Anderson, R.H. BonDurant and R.L. Pashen.....251

SIMPLIFIED QUICK FREEZING OF GOAT EMBRYOS
R. Rong, W. Guangya, Q. Jufen and W. Jianchen.....252

HORMONAL PROFILES IN SUPEROVULATED HEREFORD X BRITISH FRIESIAN HEIFERS
S. Abdul Saeed, J.S.M. Hutchinson, P.J. Broadbent and D.F. Dolman.....253

CULTURE OF BOVINE EMBRYOS FOR STEM CELL PRODUCTION
K. Schellander, C. Hassan-Hauser, F. Fuhrer, H. Korb and W. Schleger.....254

IN VITRO FERTILIZATION OF BUFFALO (Bubalus bubalis) OOCYTES MATURED IN VITRO
G. Singh, S.M. Totey and G.P. Talwar.....255

PREGNANCIES FROM CROSSBRED SPLIT EMBRYOS IN INDIAN CATTLE
G. Singh, S.M. Totey and G.P. Talwar.....256

TEMPORARY INHIBITION OF IN VITRO MEIOTIC RESUMPTION BY ADENYLATE CYSLASE STIMULATION IN IMMATURE BOVINE OOCYTES
M.A. Sirard.....257

EFFECT OF PROCEDURES UTILIZED FOR NUCLEAR TRANSFER ON BOVINE OOCYTE ACTIVATION
J.R. Slapak and M.E. Westhusin.....258

INCORPORATION OF FLUOROSCEIN-ISOTHIOCYANATE-LABELLED BOVINE SERUM ALBUMIN INTO MURINE EMBRYOS DURING IN VITRO CULTURE
A.L. Smith and S.A. Carson.....259

ESTRADIOL AND PROGESTERONE CONCENTRATIONS IN FETAL BOVINE SERUM AND THEIR IMPLICATION IN MATURATION AND FERTILIZATION IN VITRO
R.B. Stubbings, R.M. Liptrap and P.K. Basrur.....260

INDUCTION OF TWINNING IN DAIRY HEIFERS BY IPSILATERAL OR BILATERAL TRANSFER TO TWO FROZEN EMBRYOS
T. Suzuki, T. Ishida, Y. Sakai and I. Shimohira.....261

DEVELOPMENT OF BLASTOMERES ISOLATED AT THE FOUR- OR EIGHT- CELL STAGE AND EMBRYOS AFTER BISECTION AT THE MORULA AND BLASTOCYST STAGES IN THE MOUSE
T. Takeda, T. Takedomi and T. Onihara.....262

EFFECT OF THE ZONA PELLUCIDA ON VIABILITY OF CRYOPRESERVED BISECTED MOUSE MORULAE AND BLASTOCYSTS
T. Takeda, T. Takedomi and T. Onihara.....263

TRANSFER OF DAIRY COW DEMI-EMBRYOS TO YELLOW COWS
L. Tan, R. Sang, Z. Chen, X. Zheng, D. Zheng and G. Yang.....264

THE USE OF REFRACTOMETER INDEXES AS A CORRECTION FACTOR FOR VARYING URINARY ESTRONE CONJUGATES IN RHESUS MONKEYS
J.K. Thibodeaux, K.H. Graves, C.A. Anzalone, S.A. Voelkel, J.D. Roussel, R.W. Adkinson and L.L. Goodeaux.....265

EFFECT OF CRYOPROTECTANT CONCENTRATION ON MOUSE EMBRYO DEVELOPMENT FOLLOWING RAPID FREEZING
W.K. Thomas, K.A. Biery and D.C. Kraemer.....266

CHEMICALLY-INDUCED VIRAL RESISTANCE IN PREIMPLANTATION BOVINE EMBRYOS
M.S. Thomson, R.C. Bird, D.A. Stringfellow, C.R. Rossi and L.H. Lauerman.....267

SUPEROVULATORY RESPONSE IN LACTATING BOS INDICUS X BOS TAURUS COWS PRIMED WITH FSH-P AT THE BEGINNING OF THE ESTROUS CYCLE
S.M. Totey, G. Singh and G.P. Talwar.....268

LOW DOSE OF FSH EARLY IN ESTROUS CYCLE ENHANCES SUPEROVULATORY RESPONSE IN HEIFERS
K. Touati, P. Van Der Zwalmen, F.J. Ectors, J.F. Beckers and F. Ectors.....269

VITRIFICATION OF BOVINE BLASTOCYSTS
P. Van Der Zwalmen, K. Touati, F.J. Ectors, A. Massip, J.F. Beckers and F. Ectors.....270

CULTURE OF AGAR-EMBEDDED ONE AND TWO CELL BOVINE EMBRYOS AND EMBRYOS PRODUCED BY NUCLEAR TRANSFER IN THE SHEEP AND RABBIT OVIDUCT
M.E. Westhusin, J.R. Slapak, D.T. Fuller and D.C. Kraemer.....271

SEX DETECTION OF THE BOVINE FETUS USING LINEAR ARRAY REAL-TIME ULTRASONOGRAPHY
D. Wideman, C.G. Dorn and D.C. Kraemer.....272

RECOMBINANT BOVINE FOLLICLE-STIMULATING HORMONE: DOSE AND DURATION REGIMENS FOR SUPEROVULATION OF EMBRYO DONORS
J.M. Wilson, K. Moore, A.L. Jones and C.R. Looney.....273

SEXING AND BISECTING BOVINE EMBRYOS PRODUCED BY IN VITRO MATURATION AND FERTILIZATION
K.P. Xu, L. Picard, W. King and A.K. Goff.....274

TERM DEVELOPMENT OF CHIMERIC RABBITS FROM COMBINED DAY-2 AND DAY-3 MORULAE
X. Yang and R.H. Foote.....275

FERTILIZATION OF BOVINE OOCYTES BY SPERM INJECTION
A.I. Younis, C.L. Keefer and B.G. Brackett.....276

FERTILIZATION OF RAT OOCYTES IS ENHANCED BY FSH DURING IN VITRO MATURATION OF OOCYTE-CUMULUS COMPLEXES
X. Zhang and D.T. Armstrong.....277

PRODUCTION OF MONOZYGOTIC TWINS BY BISECTION OF FROZEN-THAWED MOUSE EMBRYOS
Z. Yong, W. Jianchen and Q. Jufen.....278

Number 2, February 1989

CHANGES IN QUALITY OF STALLION SPERMATOZOA DURING CRYOPRESERVATION: PLASMA MEMBRANE INTEGRITY AND MOTION CHARACTERISTICS
E.L. Blach, R.P. Amann, R.A. Bowen and D. Frantz.....283

IN VIVO CULTURE OF EMBRYOS IN THE IMMATURE MOUSE OVIDUCT
K.M. Ebert and V.E. Papaioannou.....299

DETERMINATION OF MINIMUM WEANING SCROTAL CIRCUMFERENCE IN SANTA GERTRUDIS BULLS FED A LOW ENERGY RATION
S.G. Evans and J.N. Wiltbank.....309

EFFECTS OF GnRH ON SUPEROVULATED CATTLE
A.R. Prado Delgado, R.P. Elsden and G.E. Seidel, Jr.....317

INTERSTRAIN INSEMINATIONS AND EMBRYO TRANSFERS BETWEEN THE SLA MINIATURE PIG AND STANDARD CROSSBRED PIG
K.J. Lipetz, J.R. Diehl and L.D. Stuart.....323

EFFECTS OF HORMONE-INDUCED SUPEROVULATION ON LATENT INFECTIOUS BOVINE RHINOTRACHEITIS VIRUS IN CATTLE
B.C. Chiang, K.E. Nusbaum, D.A. Stringfellow and P.C. Smith.....331

STALLION EJACULATION INDUCED BY MANUAL STIMULATION OF THE PENIS
J. Crump, Jr. and J. Crump.....341

THE EFFECT OF WEIGHT ON INTRAVAGINAL PRESSURE AND VULVAL CONFORMATION OF MARES
P.J. Goddard and W.E. Allen.....347

RELATIONSHIP BETWEEN STEROID LEVELS IN PERIPHERAL SERUM AND UTERINE TISSUE DURING PSEUDOPREGNANCY IN RABBIT
F.J. Dugre, R.D. Lambert, A. Belanger and M.A. Fortier.....353

FERTILITY OF BOS INDICUS AND BOS INDICUS X BOS TAURUS CROSSBREED CATTLE AFTER ESTRUS SYNCHRONIZATION
A. Tegegne, A.C. Warnick, E. Mukasa-Mugerwa and H. Ketema.....361

BUSERELIN IN A SUPEROVULATORY REGIMEN FOR HOLSTEIN COWS. 1. PITUITARY AND OVARIAN HORMONE RESPONSE IN AN EXPERIMENTAL HERD
H.J. Voss, S.E. Allen, R.H. Foote, P. Im, C-K. Kim and P. Aquadro.....371

BUSERELIN IN A SUPEROVULATORY REGIMEN FOR HOLSTEIN COWS. 2. YIELD AND QUALITY OF EMBRYOS IN COMMERCIAL HERDS
R.H. Foote, S.E. Allen and B. Henderson.....385

PROGESTERONE LEVELS AND LITTER PERFORMANCE OF SOWS FOLLOWING POSTPARTUM ADMINISTRATION OF PROSTAGLANDIN F2∝
M.P. Tarrier, H.G. Kattesh and B.E. Gillespie.....393

THE CYCLE OF THE SEMINIFEROUS EPITHELIUM IN THE AUSTRALIAN SWAMP BUFFALO
C.J. McCool, K.W. Entwistle and M.P. Townsend.....399

CLINICAL USE OF NORGESTOMET EAR IMPLANTS OR INTRAVAGINAL PESSARIES FOR SYNCHRONIZATION OF ESTRUS IN ANESTROUS DAIRY GOATS
K.N. Bretzlaff and N. Madrid.....419

CARDIOTOCOGRAPHY IN COWS: A METHOD FOR MONITORING CALVES DURING DELIVERY
F.H. Jonker, M.A.M. Taverne and G.C. van der Weyden.....425

EMBRYO TRANSFER IN THE WHITE-TAILED DEER: A REPRODUCTIVE MODEL FOR ENDANGERED DEER SPECIES OF THE WORLD
S.J. Waldhalm, H.A. Jacobson, S.K. Dhungel and H.J. Bearden.....437

INFLUENCE OF EXTENDER, CRYOPERSERVATIVE AND SEMINAL PROCESSING PROCEDURES ON POSTTHAW MOTILITY OF CANINE SPERMATOZOA FROZEN IN STRAWS
T.T. Olar, R.A. Bowen and B.W. Pickett.....451

DEVELOPMENT OF PIG BLASTOCYSTS IN VITRO IS ALTERED BY SERUM BOVINE SERUM ALBUMIN AND AMINO ACIDS AND VITAMINS
B.A. Meyen, C.F. Rosenkrans, Jr. and D.L. Davis.....463

IMPROVED EMBRYO YIELD AND CONDITION OF DONOR OVARIES IN COWS AFTER PMSG SUPEROVULATION WITH MONOCLONAL ANTI-PMSG ADMINISTERED SHORTLY AFTER THE PREOVULATORY LH PEAK
S.J. Dieleman, M.M. Bevers, Y.A. Wurth, J. Th. Gielen and A.H. Willemse.....473

CORRELATION OF SCROTAL CIRCUMFERENCE AND AGE IN AMERICAN BRAHMAN BULLS
D.L. Morris, C.L. Tyner, P.G. Morris, R.L. Forgason, J.L. Forgason, J.S. Williams and M.F. Young.....489

Number 3, March 1989

PHENOTYPIC RELATIONSHIPS OF SCROTAL CIRCUMFERENCE TO FRAME SIZE AND BODY WEIGHT IN PERFORMANCE-TESTED BULLS
R.D. Schrammm, P.I. Osborne, W.V. Thayne, W.R. Wagner and E.K. Inskeep.....495

EFFECTS OF FEEDING ENDOPHYTE-INFECTED TALL FESCUE SEED ON REPRODUCTIVE PERFORMANCE OF FEMALE CD-1 MICE VIA COMPETITIVE BREEDING
P.M. Zavos, S.K. Hunt, R.J. Grove, D.R. Varney, M.R. Siegel and R.W. Hemken.....505

SECRETORY PATTERNS OF LH AND FSH AND FOLLICULAR GROWTH FOLLOWING ADMINISTRATION OF PGF2α DURING THE EARLY LUTEAL PHASE IN CATTLE
J.R. Parfet, C.A. Smith, D.L. Cook, D.M. Skyer R.S. Youngquist and H.A. Garverick.....513

SUCCESSFUL INTERCONTINENTAL TRANSPORT OF PORCINE EMBRYOS FROM EUROPE TO SOUTH AMERICA
H. Niemann, A. Wust and J.C. Gardon.....525

INTRINSIC AND EXTRINSIC FACTORS INFLUENCING STEROID PRODUCTION IN VITRO BY BOVINE FOLLICLES
Th.A.M. Kruip and S.J. Dieleman.....531

TIME OF OVULATION IN THE SOUTH AUSTRALIAN MERINO EWE FOLLOWING SYNCHRONIZATION OF ESTRUS. 1. VARIATION WITHIN AND BETWEEN FLOCKS
S.K. Walker, D.H. Smith, B. Godfrey and R.F. Seamark.....545

TIME OF OVULATION IN THE SOUTH AUSTRALIAN MERINO EWE FOLLOWING SYNCHRONIZATION OF ESTRUS. 2. EFFICACY OF GNRH TREATMENT AND ITS RELEVANCE TO INSEMINATION PROGRAMS UTILIZING FROZEN-THAWED SEMEN
S.K. Walker, D.H. Smith, P. Ancell and R.F. Seamark.....555

EFFECT OF EARLY POSTPARTUM TREATMENT WITH PROSTAGLANDIN F2α ON SUBSEQUENT FERTILITY IN THE DAIRY COW
D.G. McClary, M.R. Putnam, J.C. Wright and J.L. Sartin, Jr.....565

CONVERSION OF STEROIDS IN BOVINE BLOOD IN VITRO
H.S. Choi, E. Mostl and E. Bamberg.....571

REPRODUCTIVE FUNCTION IN THE AUSTRALIAN SWAMP BUFFALO BULL: AGE EFFECTS AND SEASONAL EFFECTS
C.J. McCool and K.W. Entwistle.....583

THE EFFECTS OF CAPTURE STRESS ON TESTIS FUNCTION IN THE AUSTRALIAN SWAMP BUFFALO (BUBALUS BUBALIS)
C.J. McCool and K.W. Entwistle.....595

COMPARISON OF PREGNANCY RATES ACHIEVED WITH FROZEN SEMEN USING TWO PACKAGING METHODS
C.C Love, W.L. Loch, F. Bristol, M.C. Garcia and R.M. Kenney.....613

EFFECTS OF LINER COMPOSITION, COOLING PROFILE AND TIME OF GLYCEROLIZATION ON SURVIVAL OF BOVINE SPERMATOZOA
S.A. Salhab and C.P. Merilan.....623

A STUDY OF NONSURGICAL EMBRYO TRANSFER IN THE MARE
K.F. Dowsett, R.A. Woodward and D.A.V. Bodero.....631

PREDICTION OF FERTILITY OF BOVINE SEMEN: PRELIMINARY STUDIES WITH THE HAMSTER EGG PENETRATION TEST
M.D. Eaglesome and S.A. Miller.....643

RISK EVALUATION FOR BOVINE EMBRYO TRANSFER SERVICES USING COMPUTER SIMULATION AND ECONOMIC DECISION THEORY
B.D. Slenning and M.B. Wheeler.....653

ANDROGEN METABOLITES IN BOVINE FOLLICULAR FLUID
J. Prevost, A. Belanger, C. Bernard and R.D. Lambert.....675

ZONA FRACTURE DAMAGE AND ITS AVOIDANCE DURING THE CRYOPRESERVATION OF MAMMALIAN EMBRYOS
W.F. Rall and T.K. Meyer.....683

THE EFFECTS OF ESTROUS COW SERUM ON THE IN VITRO MATURATION AND FERTILIZATION OF THE BOVINE FOLLICULAR OOCYTE
A. Sanbuissho and W.R. Threlfall.....693

IMPROVEMENT OF RADIOIMMUNOASSAYS FOR PROSTAGLANDINS IN BOVINE BLOOD PLASMA AND THEIR APPLICATION TO MONITOR REPRODUCTIVE FUNCTIONS
H.H.D. Meyer, G. Enzenhofer and H. Feck.....701

SEASONALITY OF OVULATION AND ESTRUS IN BORDER LEICESTER EWES
D.G. Hall and I.D. Killeen.....721

Number 4, April 1989

EFFECT OF GOSSYPOL AND ITS METABOLITE ON IN VITRO EARLY DEVELOPMENT OF MOUSE EMBRYOS
Y.C. Lin, R. Rajamahendran, Y. Rikihisa and F.C. Gwazdauskas.....727

THE USE OF SYNTHETIC GONADOTROPIN RELEASING HORMONE TREATMENT IN THE COLLECTION OF SHEEP EMBRYOS
S.K. Walker, D.H. Smith, A. Frensham, R.J. Ashman and R.F. Seamark.....741

COMPARISONS OF EIGHT COMMERCIAL ON-FARM MILK PROGESTERONE TESTS
R.L. Nebel, D.L. Altemose, T.W. Munkittrick, D.J. Sprecher and M.L. McGilliard.....753

INFLUENCE OF SUMMER HEAT STRESS ON PREGNANCY RATES OF LACTATING DAIRY CATTLE FOLLOWING EMBRYO TRANSFER OR ARTIFICIAL INSEMINATION
D.J. Putney, M. Drost and W.W. Thatcher.....765

ENDOCRINE AND SUPEROVULATORY RESPONSES IN HEIFERS PRETREATED WITH FSH OR BOVINE FOLLICULAR FLUID
J.G. Lussier and T.D. Carruthers.....779

FARROWING INDUCTION WITH CLOPROSTENOL-XYLAZINE COMBINATION
J.C.H. Ko, L.E. Evans, W.H. Hsu and S.M. Hopkins.....795

ENDOCRINE, ESTROUS AND PREGNANCY RESPONSE TO VARYING DOSAGES OF LUPROSTIOL IN BEEF COWS
N.I. Plata, J.C. Spitzer, D.M. Henricks, C.E. Thompson, B.B. Plyler and T.J. Newby.....801

ACCURACY OF ULTRASONOGRAPHY FOR PREGNANCY DIAGNOSIS ON DAYS 10 TO 22 IN HEIFERS
J.P. Kastelic, S. Curran and O.J. Ginther.....813

DEVELOPMENT OF MOUSE EMBRYOS IN MEDIA CONTAINING LECTINS
A.R. Menino, Jr., J.S. Williams and C.S. Gardiner.....821

ACCURACY OF PREDICTING THE LH SURGE AND OPTIMAL INSEMINATION TIME IN HOLSTEIN HEIFERS USING A VAGINAL RESISTANCE PROBE
R.W. Canfield and W.R. Butler.....835

EFFECTS OF EXOGENOUS OVINE GROWTH HORMONE ON REPRODUCTION, SERUM HORMONE PROFILES AND MILK CHARACTERISTICS IN EARLY-POSTPARTUM FINE-WOOL EWES NURSING SINGLE OR TWIN OFFSPRING
D.W. Holcombe, D.M. Hallford and W.C. Hoefler.....843

EFFECTS OF ADRENALECTOMY ON SERUM CONCENTRATIONS OF PROGESTERONE DURING THE LUTEAL PHASE OF SHEEP
K.K. Schillo, C.J. Littel, W.J. Silvia and M.A. Green.....855

ULTRASTRUCTURE OF THE DOMESTIC TOM CAT (*Felis domestica*) AND TIGER (*Panthera tigris altaica*) SPERMATOZOA
M.L. Schmehl and E.F. Graham.....861

IN VITRO CAPACITATION OF STALLION SPERMATOZOA IN CALCIUM-FREE TYRODE'S MEDIUM AND PENETRATION OF ZONA-FREE HAMSTER EGGS
J.C. Samper, E.J. Behnke, A.P. Byers, A.G. Hunter and B.G. Crabo.....875

EFFECTS OF SEASON AND LACTATION ON LUTEINIZING HORMONE SECRETION IN POSTPARTUM EWES
G.R. Newton and L.A. Edgerton.....885

IN VITRO EXPOSURE OF OVINE OVA TO *Brucella abortus*
M.G. Riddell, D.A. Stringfellow, D.F. Wolfe and P.K. Galik.....895

COMPETITION BETWEEN SPLIT AND NONMANIPULATED EMBRYOS IN THE PRODUCTION OF IDENTICAL PIGLETS
K. Ash, G.B. Anderson, R.H. BonDurant R.L. Pashen, K.M. Parker and T. Berger.....903

THE OXYTOCIC EFFECT OF XYLAZINE ON THE CANINE UTERUS
L.G. Wheaton, G.J. Benson, W.J. Tranquilli and J.C. Thurmon.....911

INDUCTION OF TWINNING IN CROSSBRED HEIFERS BY IPSILATERAL FROZEN EMBRYO TRANSFER
T. Suzuki, Y. Sakai, T. Ishida, S. Matsuda, H. Miura and K. Itoh.....917

IN VITRO FERTILIZATION OF BOVINE FOLLICULAR OOCYTES RECOVERED BY LAPAROSCOPY
K. Schellander, R.A. Fayrer-Hosken, C.L. Keefer, L.M. Brown, H. Malter, C.E. McBride and B.G. Brackett.....927

EFFECTS OF DEXAMETHASONE ON THE ESTROUS CYCLE LENGTH IN BLACK BENGAL GOATS (*capra hircus*)
M.G.S. Alam, J.U. Ahmed and S. Jahan.....935

ERRATUM.....943

Number 5, May 1989

A SPECTROPHOTOMETRIC PROCEDURE FOR THE DETERMINATION OF OBJECTIVE MEASUREMENTS OF EQUINE SPERMATOZOAN MOTILITY
D.J. Jasko, K. Smith, T.V. Little D. Lein and R.H. Foote.....945

THE RELATIONSHIP OF INFERTILITY TO ANTIBODY PRODUCTION IN THE UTEROVAGINAL SPERM STORAGE TUBULES OF TURKEY BREEDER HENS
T.A. Kirk, H.P. Van Krey, R.M. Hulet, E.A. Dunnington and D.M. Denbow.....955

INVESTIGATIONS OF THE INCIDENCE OF BOVINE TRICHOMONIASIS IN NEVADA AND OF THE EFFICACY OF IMMUNIZING CATTLE WITH VACCINES CONTAINING *Tritrichomonas foetus*
W.G. Kvasnicka, R.E.L. Taylor, J-C. Huang, D. Hanks, R.J. Tronstad, A. Bosomworth and M.R. Hall.....963

HASTENED TRANSPORT OF EQUINE EMBRYOS THROUGH THE OVIDUCT OF THE MARE
R.T. Geary, J.A. Weber and G.L. Woods.....973

EFFECT OF ACTINOMYCES PYOGENES AND GRAM-NEGATIVE ANAEROBIC BACTERIA ON THE DEVELOPMENT OF BOVINE PYOMETRA
P.W. Farin, L. Ball, J.D. Olson, R.G. Mortimer, R.L. Jones, W.S. Adney and A.E. McChesney.....979

SUPEROVULATION IN NONSEASONAL JAPANESE NATIVE GOATS, WITH SPECIAL REFERENCE TO THE DEVELOPMENTAL PROGRESSION OF EMBRYOS
Y. Tsunoda and T. Sugie.....991

A REVIEW OF THE EPIDEMIOLOGIC ASPECTS OF EMBRYO TRANSFER FROM *Brucella abortus*-INFECTED COWS
D.A. Stringfellow and J.C. Wright.....997

EQUINE BODY TEMPERATURE AND PROGESTERONE FLUCTUATIONS DURING ESTRUS AND NEAR PARTURITION
S.F. Ammons, W.R. Threlfall and R.C. Kline.....1007

DEVELOPMENT OF A BUFFER SYSTEM FOR DIALYSIS OF BOVINE SPERMATOZOA BEFORE FREEZING. 1. EFFECT OF ZWITTERION BUFFERS
M.A. Garcia and E.F. Graham.....1021

DEVELOPMENT OF A BUFFER SYSTEM FOR DIALYSIS OF BOVINE SPERMATOZOA BEFORE FREEZING. 2. EFFECT OF SUGARS AND SUGAR ALCOHOLS ON POSTTHAW MOTILITY
M.A. Garcia and E.F. Graham.....1029

DEVELOPMENT OF A BUFFER SYSTEM FOR DIALYSIS OF BOVINE SPERMATOZOA BEFORE FREEZING. 3. EFFECT OF DIFFERENT INORGANIC AND ORGANIC SALTS ON FRESH AND FROZEN-THAWED SEMEN
M.A. Garcia and E.F. Graham.....1039

DEVELOPMENTAL ABILITY OF PORCINE OVA MATURED IN PORCINE FOLLICULAR FLUID IN VITRO AND FERTILIZED IN VITRO
K. Naito, Y. Fukuda and I. Ishibashi.....1049

CASE-REFERENT STUDY OF CYSTIC OVARIES AS A RISK INDICATOR FOR TWIN CALVINGS IN DAIRY COWS
P.H. Bendixen, P.A. Oltenacu and L. Andersson.....1053

PREGNANCY DIAGNOSIS IN SWINE BY PALPATION AND BY AMPLITUDE-DEPTH ULTRASOUND SCANNING
S. Pyorala.....1067

A METHOD OF ARTIFICIAL INSEMINATION IN CAPTIVE WHITE-TAILED DEER (Odocoileus virginianus)
S.J. Magyar, T. Biediger, C. Hodges, D.C. Kraemer and S.W.J. Seager.....1075

THE ROLE OF ENDOGENOUS ESTROGENS IN THE MATURATION PROCESS OF THE BOVINE PLACENTA
E. Grunert, D. Ahlers and W. Heuwieser.....1081

RELATIONSHIPS BETWEEN FERTILITY, PEAK MILK YIELDS AND LACTATIONAL PERSISTENCY IN DAIRY COWS
I.J. Lean, J.C. Galland, and J.L. Scott.....1093

SONOGRAPHIC FETOMETRY IN THE BOVINE
W. Kahn.....1105

EFFECT OF ZEARALENONE AND ESTRADIOL BENZOATE ON SERUM CONCENTRATIONS OF LH, FSH AND PROLACTIN IN OVARIECTOMIZED GILTS
M.A. Diekman, M.L. Green, J.R. Malayer, K.E. Brandt and G.G. Long.....1123

Number 6, June 1989

EARLY EMBRYONIC DEVELOPMENT IN THAI SWAMP BUFFALO (Bubalus bubalis)
P. Chantaraprateep, C. Lohachit, M. Techakumphu, G. Kobayashi, P. Virakul A. Kunayongkrit, P. Prateep and A. Limskul.....1131

DIAGNOSTIC AIDS FOR THE DETECTION OF URINE IN THE EQUINE EJACULATE
G.C. Althouse, S.W.J. Seager, D.D. Varner and G.W. Webb.....1141

PRELIMINARY IMPLICATIONS OF B-MODE ULTRASONOGRAPHY OF THE TESTICLES OF BEEF BULLS WITH NORMAL BREEDING SOUNDNESS EXAMINATIONS
R.E. Cartee, B.W. Gray, T.A. Powe, R.S. Hudson and J. Whitesides.....1149

TOXICITY EFFECTS OF LATEX GLOVES ON BOAR SPERMATOZOA
J.C.H. Ko, L.E. Evans and G.C. Althouse.....1159

THE PREDICTIVE VALUE, SENSITIVITY AND SPECIFICITY OF PALPATION PER RECTUM AND TRANSRECTAL ULTRASONOGRAPHY FOR THE DETERMINATION OF BOVINE LUTEAL STATUS
D.J. Sprecher, R.L. Nebel and S.S. Whitman.....1165

TEMPORAL RELATIONSHIPS AMONG ESTRUS, BODY TEMPERATURE, MILK YIELD, PROGESTERONE AND LUTEINIZING HORMONE LEVELS, AND OVULATION IN DAIRY COWS
R. Rajamahendran, J. Robinson, S. Desbottes and J.S. Walton.....1173

UTERINE PRESENSITIZATION AND EMBRYO SURVIVAL AND GROWTH IN BOOROOLA MERINO X SOUTH AUSTRALIAN MERINO EWES
D.O. Kleemann, S.K. Walker, J.R.W. Walkley D.H. Smith, R.J. Grimson, B.A. Stone and R.F. Seamark.....1183

EFFECTS OF PROSTAGLANDIN F2α DOSAGE ON SYNCHRONIZING OVINE ESTRUS USING A MODIFIED SINGLE INJECTION REGIMEN
K.F. Hoppe and A.L. Slyter.....1191

DEVELOPMENTAL COMPETENCE OF PIG OOCYTES MATURED AND FERTILIZED IN VITRO
M. Mattioli, M.L. Bacci, G. Galeati and E. Seren.....1201

ULTRASONOGRAPHIC DETERMINATION OF OVARIAN FOLLICULAR DEVELOPMENT IN SUPEROVULATED HEIFERS PRETREATED WITH FSH-P AT THE BEGINNING OF THE ESTROUS CYCLE
F. Grasso, L.A. Guilbault, G.L. Roy and J.G. Lussier.....1209

EFFECT OF INTRAUTERINE INFUSION OF SPERM ANTIGENS ON GILT FERTILITY
A.D. Gooneratne and P.A. Thacker.....1221

STAGE-DEPENDENT VIABILITY OF VITRIFIED RABBIT EMBRYOS
Z. Smorag, B. Gajda, B. Wieczorek and J. Jura.....1227

SINGLE APPOINTMENT INSEMINATION FOR HEIFERS AFTER PROSTAGLANDIN OR PROGESTIN SYNCHRONIZATION OF ESTRUS
B.E. Seguin, H.W. Momont, H. Fahmi, M. Fortin and A. Tibary.....1233

CIRCULATING CONCENTRATIONS OF THYROID HORMONES IN PREGNANT CAMELS (Camelus dromedarius)
S.P. Agarwal, N.D. Khanna, V.K. Agarwal and P.K. Dwaraknath.....1239

A SEROLOGIC STUDY OF THE PROGENY OF A *Brucella abortus* SEROPOSITIVE COW
M.R. Del Campo, R. Tamayo and C.H. Del Campo.....1249

DIPHALLIA IN A MIXED-BREED DOG WITH MULTIPLE ANOMALIES
S.D. Johnston, N.C. Bailie, D.W. Hayden, G.R. Johnston and C.A. Osborne.....1253

AUTHOR INDEX (Volume 31).....1261

SUBJECT INDEX (Volume 31).....1267

CONTENTS (Volume 31).....1272